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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

FOREST INSECTS AND INSECT CONTROL

IN OUR NATIONAL PARKS

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Magnificent forests are one of the greatest attractions to most of our national parks. Glaciers, rivers, lakes, canyons, geysers and other natural phenomena may be the main attraction that lures the sightseer, but he would not linger long if it were not for the surrounding forest that provides an appropriate setting for Nature's objects of wonder or beauty. Forests form a living ground for the remnants of our once abundant wild life. They also conserve the water supply which produces the streams, falls and lakes that make the wilderness areas so attractive to most people.

National Park forests differ from national forests, other government forests, many state forests and most private forests because they are not established for the value of the timber, forage or water power that they produce, but because of their value for recreational, wild life, natural history and educational purposes. For this reason their value is greater, and more intensive and expensive methods of protection are justified.

Among the greatest enemies of our national park forests are destructive insects. The mountain pine beetle, Dendroctonus monticolae Hopk., has killed large areas of lodgepole pine in the Yosemite and Crater Lake parks. It has killed many sugar pine in the Yosemite and Sequoia, western white pine in the Rainier and Glacier, and white-bark pine in the Glacier and the Yellowstone. The Black Hills beetle, Dendroctonus ponderosae Hopk., killed an average of 100,000 yellowpine in the Grand Canyon Park and the adjacent Kaibab National Forest during the five-year period from 1919 to 1925. It is now working in the Rocky Mountain Park. Other species of barkbeetles, such as the western pine beetle, Dendroctonus brevicornis Lec., the Douglas fir beetle, Dendroctonus pseudotsugae Hopk., and the Engelmann spruce beetle, Dendroctonus engelmanni Hopk., have killed numerous trees in several of the parks. The spruce budworm, Cacoecia fumiferana (Clemens) defoliated and killed several thousand acres of Douglas fir forest in the Roosevelt Canyon section of the Yellowstone between 1920 and 1925. During the same period the lodgepole sawfly, Neodiprion sp., and the lodgepole needletyer, Eulia sp., killed twelve thousand acres of lodgepole pine in the West Yellowstone section of the Yellowstone. Various engraver beetles, Ips sp., have killed numerous lodgepole around camp sites and geyser formation areas in the Yellowstone, and pinon pine on the Mesa Verde. Borers of several species have caused trouble in the Yellowstone to lodges built of unbarked logs.

Forest insect problems in the national parks naturally fall into four classes:

First is the problem of perpetuating the forest as a whole. In this case the individual tree is not important. We do not care if one tree dies, so long as another takes its place. A forest with many scattering dead trees appears perfectly normal when viewed as a whole. We do care, however, if an entire forest is devastated. Every effort should be made to prevent such epidemics as those of the Black Hills beetle in the Kaibab section of the Grand Canyon Park, and of the needletyer and sawfly defoliators in the Yellowstone.

The second problem is one of keeping a forest growth, or at least some trees, on special areas such as camp and administrative sites and along the highways. This is an important problem in all the parks. Camp sites in particular are nearly always chosen because of an attractive growth of trees. Soon, however, the continual packing of the soil and other unnatural conditions caused through intensive use by many more or less irresponsible human beings brings about an unhealthy condition, which attracts insects and favors diseases that may cause the death of many trees. Camps with their buildings and other improvements represent large investments, and it is therefore important that the trees surrounding them be kept in as attractive a condition as possible. If the trees die the camps must be moved, with consequent loss in investment and further destruction of natural resources, or else new trees must be grown to take the places of those lost. Trees along the highways are growing under more adverse conditions than those in the undisturbed forest. They are also more valuable because viewed at closer range by the traveling public. Any poor condition is immediately noted and creates an unfavorable impression.

Third is the problem of protecting the individual tree, especially valuable because of its aesthetic, educational or historical interest. Examples of this class are the giant sequoias of the Yosemite, General Grant and Sequoia National Parks, and the best specimens of sugar pine and yellow pine in the Yosemite. These are irreplaceable, and should be kept as they are as long as possible without regard to the cost. The more valuable the tree the greater the interest in it, and the more it is apt to be injured unintentionally by its many admirers. Once harmed in any way it becomes more liable to insect attack, and must be watched closely so that preventive measures may be taken before it is too late.

Fourth, we have the problem of protecting buildings constructed of forest trees felled and cut into logs. Many camps and administrative buildings are now made of logs, and this will probably always be the case. Where timber is plentiful it is more economical to construct log buildings. Then, too, this type of construction is more appropriate, fitting and attractive in a national park, where the glorification of Nature is the main object. The great drawback, however, where buildings are made of unbarked and untreated logs, is the damage caused by various species of bark- and wood-boring grubs. These mine through the inner bark and outer wood until much of it is destroyed. The buildings themselves become unsightly when the bark becomes riddled with wormholes and falls off, and the boring dust continually falling down into rooms, especially diningrooms, is particularly annoying and disagreeable.

Forest insect conditions being as they are in the national parks, the only logical way to face the problem is to control the insects. Known methods of control should be introduced where feasible, and new methods developed where the conditions demand it. Values and other conditions being different in national park forests from those in forests primarily valuable for their timber, it is logical to suppose that different methods of control can be used to advantage.

As with all insects, the method used to control a destructive forest insect depends upon the life history and habits of the insect. An insect that kills the tree by feeding on and destroying the foliage is usually fought by poisoning the foliage, or by applying some smothering or corrosive substance to the insect while it is on the foliage. An insect that kills the tree by boring through and destroying the living inner bark and outer wood, thus girdling it, is fought by destroying the insect while it is developing under the bark of an infested dying tree. The insect may be destroyed by felling and burning the infested tree, or by felling and turning it in the hot sun for several days, or by felling and barking it. This destruction of the insect prevents it from reaching full development, emerging and attacking a living tree.

Forest insect problems in the national parks are handled through inter-departmental cooperation. Forest entomologists of the Department of Agriculture investigate infestations of destructive insects and recommend methods of protection; park administrators determine the feasibility of the recommendations and carry them out. Investigations of various insect infestations have been made in the Sequoia, Yosemite, Crater Lake, Rainier, Glacier, Yellowstone, Grand Canyon, Mesa Verde and Rocky Mountain Parks. Control work has been carried on in the Sequoia, Yosemite, Crater Lake, Yellowstone, Grand Canyon and Rocky Mountain.

Speaking generally, we may say that destructive infestations of insects in park forests may be expected at any time, and that forest insects play about the same role in national park forests as in other forests. The more intensive use of the trees, however, and their greater value for recreational, educational and historical purposes makes it possible and justifiable to use more intensive and expensive methods of control. This gives reasonable assurance that the park forests will be kept in as natural a condition as possible, which is the main reason for the creation and existence of the national parks.

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